

ARTICLE 416 (RECREATION MANAGEMENT PLAN)

PROJECT NO. 2035-006

Purpose

This *Recreation Management Plan* meets the requirements of Article 416 of the license and the Forest Service's 4(e) Conditions, in particular Condition 106 (*Project Recreation Plan*).

The Gross Reservoir *Recreation Management Plan* (RMP) was developed to finalize the recreation facility improvements outlined in the *Environmental Assessment for Hydropower License* (1999). Initiated by the Federal Energy Regulatory Commission (FERC), this plan provides the blueprint for the implementation of recreation improvements required for the license of Gross Reservoir.

As outlined in the *FERC Environmental Assessment and Recreation Plan* (2000), ten sites were selected for future facility improvements and appropriate recreational use. Building upon recreation-related recommendations delineated in this assessment, the *RMP* will further define management strategies and provide designs for recreation facilities, resource management and law enforcement and safety. In general, improvements will provide parking, trailhead staging, picnicking, hiking, fishing, camping and non-motorized boating. Facility recommendations and recreational programming from earlier planning efforts were refined and revised as part of the *RMP*.

FERC Requirements

The following six items address specific requirements of FERC Article 416. (*This section is followed by a detailed description of the existing site conditions and specific recommendations for the ten recreation sites*).

1. Implementation Schedule

Once the *Recreation Management Plan* is approved, implementation will begin at the Haul Road non-motorized boat launch. Over the course of the next five years, all aspect of the plan will be implemented in a prioritized manner.

2. Management Measures

Throughout the development of the *Recreation Management Plan*, specialist spent considerable time in the field exploring design alternatives that maximized resource protection and still provided for an array of recreation activities. Extensive efforts were undertaken to minimize tree loss, erosion, and encroachment upon sensitive wildlife habitats and resource areas (see Articles 401 and 405 *Erosion Control and Restoration Plan* as well as Article 414 *Visual Resource Protection Plan* and Article 417 *Recreation Monitoring Plan* for specific management measures). The *Recreation Monitoring Plan* also aids in managing the resources.

3. Douglas Fir Old Growth Forest Preservation At South Boulder Creek Inlet Trail

For the most part, the proposed South Boulder Creek trail follows the existing social trail alignment. Nowhere along this alignment does the new trail encroach upon Douglas fir old growth forest. Segments of the existing social trail that were not sustainable were rerouted through areas where species of special concern were not present (*see South Boulder Creek Inlet Recommendations 4.2.6 for trail specifics*).

4. Non-Motorized Car Top Boating

Non-motorized car top boating will be permitted at the Haul Road and at the Peninsula.

As described under existing conditions, the potentially volatile weather along with the cold, deep water makes boating a risky proposition on Gross Reservoir. The steep side slopes around the reservoir make launching and landing boats extremely difficult. These conditions also make escape from the water difficult during storms. Compound these factors with the reservoir's size and the seclusion of some areas and the magnitude of boating-related safety concerns for this site becomes clear.

In selecting appropriate boat launch locations, careful consideration was given to: accessibility to the water, typical reservoir conditions at the site and the ability to monitor and regulate boating activities. These factors immediately disqualified four of the seven recreation sites located on the reservoir (Rocky Point, South Boulder Creek Inlet, Winiger Gulch Inlet and Winiger Ridge). The three remaining sites (Peninsula, Dam and Haul Road) were carefully scrutinized for their suitability.

While the Dam Recreation Area provided good access and monitoring capability, the proximity to the dam spillway and the exposure to high winds made this area undesirable for use as a boat launch. In addition, the reservoir's accessibility was compromised during low water periods, when the banks become too steep for safe access. As a result, launching or boating in this area will be prohibited.

Peninsula Recreation Area (*see North Shore recommendations 4.2.1 for a complete description of parking*)

The Peninsula Recreation Area in many respects was determined to be suitable for use as a boat launch. However, steep and narrow vehicle access, lack of parking, temporary unloading issues, and management problems made this site inappropriate for automobiles. Grading studies were prepared to reconfigure the alignment of the very steep (+22%) gravel maintenance road that provides access to the Peninsula. Unfortunately, the steep drop-offs, narrow road width and subsequent hillside scarring were unavoidable, making the road unsafe and impractical for public use.

As a result, boating from the Peninsula Recreation Area will be permitted, but will require boaters to park and carry their crafts from the North Shore parking area (roughly a quarter of a mile from the Peninsula). Wider (36") access trails connecting the two areas will be provided. Boats can be launched from the gravel beaches located on either side of the Peninsula. Reservoir safety and regulatory signage will be provided at this location (*see Article 409*).

Haul Road (see *Haul Road recommendations 4.2.5 for a complete description of parking and drop-off improvements*)

Haul Road provides the safest and most accessible boat launch on Gross Reservoir. Here the road ends within a few dozen feet of the reservoir and is the closest access from the South Boulder Creek Inlet. The nestled location within a valley offers relatively good protection for boating. While the parking situation along the cliff-faced, narrow road is not ideal, provisions have been made to get boaters and their gear as close to the water as possible. Parking in this area will be permitted in designated parking spaces only.

Due to the easier access, Haul Road is anticipated to be the primary boat launch location on Gross Reservoir. Safety and regulatory signage will be provided at this location to inform boaters of the hazards and requirements on the reservoir.

Regulations

The potentially dangerous conditions on Gross Reservoir make strict boating regulations imperative. Careful consideration has been given to the size and type of vessels to be permitted on the water. While safety was the number one consideration in determining which vessels to allow, other factors were considered, including, the craft's ability to be transported in or on a passenger vehicle, ease with which it could be put in and taken out of the water and the appropriateness for use at this site.

Due to parking limitations throughout the site, all boats must be transported to the reservoir in or on a passenger vehicle. This exclusion prohibits the use of trailers and other hauling devices. The number of parking spaces at each boat launch location will determine the boating capacity on the reservoir. Visitors unable to find a designated parking space will not be permitted to boat on the reservoir at that particular time. The following definition was developed to describe the vessel types permitted on the reservoir:

- **Non-motorized car-top craft** (*compiled from the Colorado State Statutes and U.S. Code of Federal Regulations*)
A recreational vessel of no more than 18 feet in length (excepting tandem, sea/ocean going or touring kayaks up to 24 feet in length), hand propelled, open, monohull, multi-compartment (chamber) inflatable craft; or non-inflatable craft, non-sailboard, subject to U.S. Coast Guard and Colorado safety standards, non-commercial, non-racing that can be lifted onto and taken from the top of a passenger vehicle.

In order to monitor and maintain the safe operation of boats on the reservoir, daily and yearly operation schedules have been established. The following operation schedule describes when boating on the reservoir is permitted:

- Gross Reservoir will be open to non-motorized, car-top craft from sunrise to sunset, from Memorial Day weekend through September 30. The reservoir will be opened to kayak take-out (South Boulder Creek to Haul Road) from May 1 to September 30. Emergency closures will be enacted when conditions (ice, water levels, fire, etc.) or Denver Water operations warrant.

Additional boating regulations that will be enacted include:

- Commercial operations are prohibited.
- All users must pay a similar daily use fee, collected as a vehicle parking fee. (Note: Financial constraints or management concerns could necessitate the implementation of a boat permit system in the future.)
- Parking is prohibited in front of all emergency gates and accesses and along selected roads.
- Required safety equipment must be carried aboard all vessels.

There are several hazards and resource protection areas located around the reservoir that will be strictly off-limits to boaters. These include:

- Areas within 100 feet of the reservoir dam and spillway.
- Resource protection areas along Forsythe Canyon and Winiger Gulch Inlet or other locations identified as important resource protection areas.

The dam closure area will be identified with warning buoys attached to a steel cable. This cable will run the entire length of the dam, 100 feet from the dam's face. Resource protection areas will be identified with signage located along the shoreline. In addition, all reservoir maps will identify areas that are closed to boating.

5. Boating Access at South Boulder Creek (*see Map15*)

While less than ideal, parallel parking along the Gross Reservoir Access Road above the bridge was determined to be the safest and least likely to interfere with Denver Water operations. When combined with a new trail, this parking location provides the best access to the creek below the gauging station.

Along this stretch of road, ten parallel parking spaces will be provided on the south shoulder. Two groups of five spaces will be located on either side of a new South Boulder Creek Outlet Trailhead. Each parking space will be approximately 8' x 20' and will be delineated with a log parking-bumper. Boulders will be located along the road to discourage drivers from parking in undesignated areas.

The new trailhead will provide better access to the creek below the gauging station. This alignment is located lower on the road and will require less elevation gain to get access down to the creek. The trail will be designed at 15% grades and will include several switchbacks. The trailhead will include signage and a trash receptacle. The signage at this location will include a map of the creek indicating put-in and take-out locations in addition to potential boating hazards and safety information.

Upon abandonment of the old trail alignment, proper trail closure and revegetation should be implemented. Duff and other materials removed during new trail construction should be dispersed along the old trail. In addition, the old tread should be scarified to promote the establishment of new vegetation.

6. Flow Information

Denver Water will collect information on current conditions (flows) on South Boulder Creek (both above and below the reservoir). This information will be made available to the public on the Colorado Division of Water Resources' Watertalk (303) 831-7135 and the appropriate web sites.

I. BACKGROUND & SITE SPECIFIC CONDITIONS AND RECOMMENDATIONS

1.1 Background

In the late 1940s, the City of Denver proposed construction of a reservoir on South Boulder Creek as part of the City's water supply system. A license to construct, operate and maintain this impoundment – Gross Reservoir- was issued in 1951, with an expiration date of 2000. Although the majority of facilities for water storage were built in the 1950s, a proposed hydroelectric generation plant was never constructed.

In April of 1998, Denver Water filed an application with the Federal Energy Regulatory Commission (FERC) for a new license to allow for continued maintenance and operation of the reservoir, and to construct new hydroelectric power facilities. Electricity generated from this hydroelectric powerhouse would be connected to Xcel Energy's transmission system, and help meet part of future regional power needs thereby conserving fossil fuel resources.

As required by the FERC, an applicant-submitted *DRAFT Environmental Assessment for Hydropower License* (1999) was prepared by Denver Water. Final recommendations were then prepared in a joint effort by Commission staff and the U.S. Forest Service. This assessment included a preliminary recreation plan that outlines appropriate recreational uses, general improvements to recreation facilities at 11 sites, trail development, and reclamation of some disturbed areas.

Following approval of the environmental assessment, Denver Water received a 40-year license from FERC to continue to operate Gross Reservoir in March 2001. As stipulated in the license, Denver Water was required to submit a *Recreation Management Plan* (RMP) to the FERC for their approval. The Environmental Assessment for Hydropower License (2000) was used as a foundation for the plan and provided direction for this recreation management planning effort.

1.2 Methodology

The *Gross Reservoir Recreation Management Plan* was developed by a project consulting team under the direction of Denver Water. The project consulting team included specialists in the areas of planning, landscape architecture, resource management, law enforcement and safety, marketing and research, ecology and restoration, and economic development.

Throughout the planning process, the project consultants met with Denver Water staff, agencies and the public to identify and discuss project issues, opportunities and constraints for facilities, uses and resource management.

The *Recreation Management Plan* was developed in two parts: (1) inventory and analysis of existing conditions and, (2) plan development and management recommendations.

Existing Conditions

The project team spent several weeks in the field analyzing and documenting existing site conditions. Several fieldtrips with Denver Water, the U. S. Forest Service and the Boulder County Sheriff's Office were conducted to help the consulting team gain an understanding of the natural and cultural resources, transportation, parking, existing recreation facilities, visual resources, visitor-use issues and the day-to-day operations at Gross Reservoir. During the course of the on-site data collection, research was being conducted on the operations and management of comparable reservoir facilities throughout Colorado.

Agency and Public Process

Meetings were held with key agencies affected by Gross Reservoir recreation management issues including the U.S. Forest Service, Boulder County Parks and Open Space, Boulder County Sheriff's Office, City of Boulder Open Space and Mountain Parks, Colorado State Parks, Coal Creek FPD, Cherryvale FPD, High Country FPD, Bureau of Land Management, Preserve Unique Magnolia Association (PUMA), U.S. Fish and Wildlife Service and the Colorado Division of Wildlife to discuss issues and opportunities at Gross Reservoir. These agencies comprised the Gross Reservoir Recreation Management Plan Stakeholder Group. Several stakeholder meetings were held at Gross Reservoir and provided an avenue for understanding the spectrum of stakeholder needs and concerns, gathering and understanding pertinent data, generating strategies and working toward consensus recommendations.

The public's input regarding interest, concerns and needs was essential to the success of this project. Three public meetings were held at key points in the process. The first of these meetings was held at the outset of the project. At this meeting the project team had the opportunity to discuss critical project issues, opportunities and constraints for facility development and resource protection. Social value surveys were completed and discussion groups were conducted to brainstorm "issues" and "solutions" regarding visitors, car-top boating, law enforcement, safety, agency management, natural resource preservation and erosion and rehabilitation. At the second public meeting the projects goals and objectives were presented. This meeting also afforded the opportunity for the public to comment on the preliminary plans and management strategies. The third public meeting will provide the opportunity to review the draft Recreation Management Plan (RMP). Included in these public meetings were a diversity of users and homeowners. Several boating advocacy groups including American Whitewater, Colorado White Water Association, Boulder Kayak and Canoe Club and the Rocky Mountain Sea Kayak Club attended the public meetings.

The information gathered from these meetings set the course for the development of the *RMP* design concepts and management recommendations.

Recommendations

Denver Water and representatives from stakeholder groups were involved extensively throughout the concept design and recommendation development phase. Meetings were held to present preliminary design concepts and management strategies. The plans evolved throughout this process as additional input was incorporated into the facility design and management recommendations.

Due to the site-specific nature of trails, campsites, and picnic areas, the locations of these facilities were agreed upon in the field with staff from Denver Water and the U.S. Forest Service. The exact locations of major trail corridors and campsites were flagged and located on topographic maps using global positioning instruments.

II. GOALS AND OBJECTIVES

2.1 Goals of the Gross Reservoir Recreation Management Plan

The goals and objectives of the *Recreation Management Plan*, as developed by Denver Water and the Gross Reservoir RMP Project Team, are as follows:

1. To develop quality recreation opportunities at Gross Reservoir which do not interfere with Denver Water's mission to provide safe public water and supply hydroelectric power;
2. To provide safe and manageable recreation experiences which have minimal impact on the resource and the surrounding environment;
3. To restore damaged resource areas and improve visual qualities, and
4. To provide cost effective and fiscally responsible operations and management of recreation facilities.

2.2 Recreation Facilities, Boating and Trails Objectives

- Provide safe recreation opportunities on and around the reservoir
- Minimize vehicular intrusion into the site
- Improve the organization of facilities
- Improve the quality of the recreation experience
- Minimize the negative impacts recreation has on natural resources
- Provide ADA accessible facilities and access to the reservoir.
- Improve siting of restroom/picnic facilities
- Develop a sustainable network of trails that link facilities

III. EXISTING CONDITIONS

The information presented in the existing conditions report was gathered through field analysis, meetings with Denver Water, the U.S. Forest Service and various stakeholder agencies. Information was also taken from the following reports: FERC No. 2035-006 *Final Environmental Assessment For Hydropower License*, Volumes I, II, III and IV of the FERC No. 2035 *Gross Reservoir Hydroelectric Project* and the *Magnolia Environmental Preservation Plan*.

The existing site conditions discussed in this report focus on those recreation areas outlined in the FERC licensing document. Several of the sites included in the *Recreation Management Plan* are not included in the FERC boundary (*see Map 2*). These sites include South Boulder Creek outlet, Jumbo Mountain picnic area and the Winiger Ridge Recreation access and parking lot.

3.1 Overall Natural & Visual Features

This section addresses the overall natural and visual features found at Gross Reservoir. Site-specific analysis for each recreation area is provided in Section 3.2.

3.1.1 Weather/Climate

The weather at Gross Reservoir is volatile. The reservoir's location at 7,250 feet of elevation near the Continental Divide leaves it exposed to rapid weather changes throughout the year. In the summer, its proximity to the Indian Peaks to the west, affords little warning of approaching convection-driven thunderstorms. In the fall, winter and early spring, it is subject to very strong gusty downslope winds as air masses from the west push over the Continental Divide and descend, warming and gathering speed (Chinook winds).

Summertime monsoons often bring short mid-afternoon thunder or hailstorms accompanied with high winds. It's not uncommon to have northwest winds reaching 80 mph during the summer. Chinook winds strike between November and March, with gusts exceeding 100 mph. In general, the northern and western aspects adjacent to the reservoir are prone to higher winds.

Summer temperatures are generally mild - days above 95 degrees are rare, humidity is low. Winter temperatures are usually quite cold. The skies are clear about 115 days out of the year and partly cloudy another 130 days. Annual precipitation averages between 20 and 25 inches. Over half of the precipitation falls during the months of April and May. January and February are the driest months. Warm, sunny winter days generally melt snow quickly, although snow can linger in some areas throughout the winter.

3.1.2 Water

Gross Reservoir is a drinking water storage facility for the city of Denver. The reservoir's primary source of water is South Boulder Creek that includes water diverted from the west slope. Flows within this watershed are supplemented with water diverted beneath the Continental Divide. Water is diverted from the west slope of the Front Range through the pilot bore of the Moffat Tunnel and into Gross Reservoir. Roughly 60,000 acre-feet of water from the Fraser River flows through the tunnel, then down South Boulder Creek and into the reservoir each year. The South Boulder Creek watershed accounts for 45 percent of the flow into Gross Reservoir (MEPP 2000). In addition to these water sources, several smaller drainages flow into Gross Reservoir including Winiger Creek and Forsythe Creek. Most of the runoff in these drainages is derived from seasonal snowmelt.

When full to the spillway crest, Gross Reservoir stores 40,990 acre-feet of water. The surface area of the reservoir covers 418 acres, creating 10.9 miles of shoreline. The water reaches a depth of 280 feet near the dam.

The depth of the reservoir results in cool water temperatures throughout the year. Summer water temperatures only reach 18 degrees Celsius (64 F) on the surface. Temperatures cool 2 degrees C (3.6 F) per foot below the surface, down to 6 feet. Below 6 feet, water temperatures are generally in the 6 (42 F) to 8 (46 F) degree C range. According to the U.S. Coast Guard, survival times for victims in water of this temperatures range from 1 to 3 hours depending upon environmental factors and the person's physical condition.

Gross Reservoir usually freezes over by January. During the mid to late winter months ice fishing occurs at several locations on the reservoir. This activity has its risks due to the unpredictability of ice conditions.

The water levels at Gross Reservoir fluctuate greatly depending upon the time of year and user demand. Rarely does the reservoir maintain a consistent level for any length of time. Water levels can fluctuate as much as 100 feet throughout the year. Typically a low water elevation of 7,180 feet occurs in early May prior to spring run-off. By mid June the reservoir usually reaches its capacity at 7,280 feet. Due to high water demands, Denver Water attempts to keep the reservoir fairly full through June, July and August. However, by July or August customer demands are usually greater than the water supply, so the water level begins to drop. During the winter there is very little fluctuation in water level.

Water supply operations will not be changed to accommodate power generation. The turbine and the generator will likely be operated from April through September as dictated by the releases to meet municipal water supply needs.

3.1.3 Physiography

Gross Reservoir lies in the foothills of the Colorado Front Range, in an area formed by the uplift and erosion of Precambrian granite bedrock. Since the end of glaciation, the landscape has been sculpted by deep erosion, the deposition of stream deposits and the downward migration of unconsolidated rock (*see photo 1, page 11*).

Elevations within the FERC boundary range from 6,800 feet below the dam on South Boulder Creek to 8,100 feet atop some of the small peaks on Winiger Ridge. In most cases the terrain slopes steeply in the direction of the reservoir. As a result, the majority of land along the south side of the reservoir has a northerly aspect and land along the north side has a southerly aspect.

With the exception of Winiger Ridge, most of the slopes surrounding Gross Reservoir are very steep. The majority of slopes exceed 25% along the reservoir's edge. This predominance of steep slopes makes access to and from the reservoir very difficult.

Located throughout the site along the reservoir's steep side slopes are numerous large granite outcrops. These formations are very prominent due to their lack of vegetation and the sheer size of the cliff walls.

Soils of upper slopes and ridges have often formed in residual material that has accumulated in-place from the disintegration of weathered granite bedrock material. Soils on side slopes and toeslopes have often formed in colluvium, unconsolidated rock material which has moved down slope under the influence of gravity.

Erosion

Most soils found around Gross Reservoir have high erosion hazard. This hazard is primarily due to steepness of slopes. While soils appear relatively stable at present, removal of their protective cover of vegetation can leave them very susceptible to erosion. In general, erosion along and above the reservoir shoreline can be described as slight with a few areas of moderate to severe erosion where human activity has long ago removed the protective vegetation cover along social trails. Where unimproved automobile access roads reach the shoreline, erosional damage is often serious (*see photo 2, page 11*). From these trail and road areas, erosion has moved thousands of tons of material into the reservoir. The bulk of sediment reaching the reservoir originates outside the immediate area affected by trails and road and is delivered by South Boulder Creek and other natural drainages.

Erosional damage in the study area has extended from the surface downward into the subsoil in many places, and in some places has removed all subsoil to expose solid granitic bedrock. The bulk of the latter severe damage is located along the North Shore area where dispersed heavy foot traffic has allowed the most extensive destabilization. After the top soil layer (generally 4 to 8 inches) is removed, the subsoil, mostly 10 to 20 inches thick, offers little resistance to erosion because most is gravelly loamy sand which means that it has few fine particles to cement the larger particles together.

3.1.4 Vegetation

The vegetation at Gross Reservoir is typical of the Lower Montane life zone (*see photo 1, page 14*). In this life zone, ponderosa pine and Douglas-fir comprise the dominant species in usually open woodland conditions. On warm south-facing slopes ponderosa pine predominates while Douglas-fir forest predominates on the cooler north facing slopes. Aspen groves are common in wetter areas where past disturbance or fire has occurred. Other plant community types found near the reservoir include small wetland or riparian areas and mountain grassland.

The conifer forests found near the reservoir range from thick stands of young trees occurring primarily on north-facing slopes to more open canopies of large trees on south and west facing slopes. In most areas, the forest is encroaching into the few remaining meadows. Forest stands include individuals of widely varying age, but are skewed toward the relatively young categories. The high density of trees has resulted in much competition between trees and frequent stressed health is apparent. Aspen forests are found in wetter areas along ravines and drainages. These

too are slowly being replaced by conifer forest. Due to earlier forestation, few if any old growth forests remain.

The suppression of natural fire cycles has resulted in a build-up of fuels in the forest. This fire hazard was demonstrated in September 2000 when the Walker Ranch Fire burned over 1,100 acres of Boulder County Open Space land on the eastern edge of the site. This fire was believed to have been caused by an unattended campfire. The fire burned for several days under hot and dry conditions. In addition to the fire hazard, suppression has also resulted in moderate to severe insect infestations.

The wetlands found within the FERC study area are located primarily along South Boulder Creek, Winiger Ridge and Forsythe Canyon. These wetlands tend to be very narrow, but offer habitats conducive to supporting a variety of plant and animal communities not found in the forested uplands. Some of the plants that can be found in these areas include: narrowleaf cottonwood, thinleaf alder, western river birch, Bebb willow, mountain willow, twinberry, chokecherry, and red-osier dogwood.

Several species of noxious weeds are found near the reservoir. Most common are cheatgrass (downy brome) and alyssum. Less common weeds found in isolated populations include diffuse knapweed, musk thistle and Canada thistle. Overall, at present weed infestations are not a serious problem, meaning that management to prevent serious infestations has strong potential to be effective.

Lists of plant species observed during 2001 vegetation surveys of Gross Reservoir area are available in Brune (2001).

3.1.5 Rare and Sensitive Species

A recent survey of the vegetation of the Gross Reservoir area (Brune 2001) has concluded that six rare / sensitive plant species and one rare plant association occur within the study area. The six plants include wild sarsaparilla (*Aralia nudicaulis*), short-scale sedge (*Carex deweyana*), Nagoon berry (*Cylactis arctica* ssp. *acaulis*), blue wood lettuce (*Lactuca biennis*), black snakeroot (*Sanicula marilandica*), and false melic (aka purple oatgrass, *Schizachne purpurascens*). None of these plants are listed as threatened or endangered by the U.S. Fish and Wildlife Service under provisions of the Endangered Species Act. All are listed as sensitive by the Colorado Natural Heritage Inventory. These six were found from within an initial list of 27 species thought to possibly be found in the area. All of these rare species are widely distributed in Canada and, in Colorado, are at the southern fringe of their natural range. Their affinity for cool, moist conditions such as exist in their main areas of occurrence in Canada is reflected in their occurrence at Gross Reservoir in cool, sheltered, often north-facing circumstances.

The plant community that was located that is classified as rare by the Colorado Natural Heritage Inventory was the “River Birch / Mesic Forb foothills riparian shrubland.”

There is also an occurrence of “Thinleaf Alder/Mesic Forb riparian shrubland” within the FERC boundary near the Winiger Gulch Inlet. Neither this habitat nor any other will be impacted by the proposed improvements.

3.1.6 Visual Resources Overview

Existing Landscape Character (see Existing Site Character, Maps 3-11)

This section addresses the existing visual conditions found at Gross Reservoir. It describes the natural settings along with the visual impacts the man-made environment has had on that setting. These findings will be used to guide new development and to mitigate the impacts of existing use and facilities.

The reservoir’s unique location offers a variety of scenes and visual experiences. The landscape aesthetics are characterized by clear water, rocky shorelines and steeply-sloped forested hillsides set against high mountain peaks in the distance - all of which give Gross Reservoir a unique “sense of place” (*see photo 2, page 14*). These scenes and visual experiences are dramatically altered according to the weather, season of the year, and time of day.

The public access roads, trails and individual sites around the reservoir offer a variety of viewpoints and visual experiences. The reservoir itself can be viewed in the foreground, middleground or background depending upon ones location. In addition to the open expanses of water found near the dam and peninsula areas, there are at least a half-dozen coves located along the reservoir’s shoreline. Each of these locations offers a unique blend of water, shoreline, vegetation and topography. Endless variations in depth of view and spatial character abound.

Social Value Surveys were conducted as part of the public process. These surveys asked participants about their use of Gross Reservoir, and their attitudes or feelings about aspects of their experience.

Many of the survey respondents said Gross Reservoir’s appeal stems from the feeling of remoteness, even though it is very close to Boulder. The lack of human-created structures and human intervention gives the reservoir an unspoiled sense of “wildness”. One respondent may have summed up the Gross Reservoir experience best by stating, “it’s Colorado”.

When asked to describe the characteristics that give the reservoir its identity or “sense of place”, survey respondents touched upon all the senses and human perceptions. Some of the more common responses included:

- The sounds of nature (wind, water and wildlife)
- The smell of the natural landscape (pines, wildflowers)
- The visual landscape aesthetic (forest, rock outcrops, water, grassy slopes, distant peaks)

Please refer to the Existing Site Conditions Maps for the ten recreation sites to understand the specific landscape character at each site.

Human-Created Environment

The man-made environment includes buildings, roads, signage, utilities or any other human-caused deviation in form, line, color, and texture in the landscape. Human perception recognizes interventions in the landscape. The additions to the landscape can either integrate well into the environment or detract from the environment, depending upon facility placement, design and sensitivity to the landscape.

For many visitors these interventions detract from the site's scenic integrity. The surveys (see appendix) indicated that the sites where the most human intervention and landscape disturbance had occurred were generally rated the lowest, while the sites that were more pristine rated the highest.

3.1.7 Fish and Wildlife

Gross Reservoir and the surrounding area is host to a wide variety of fish and wildlife both resident and migratory. Here like many foothill areas along Colorado's Front Range, habitat alteration has resulted from increased human activity. New roads, residential development and increased recreation have begun to shift animal communities from their historic ranges. The areas around Gross Reservoir provide essential habitat, and serve as seasonal migration routes for a number of animal species. Significant alterations to these habitats can have lasting impacts on animal populations.

There are many species found within the Gross Reservoir area including: mule deer, elk, black bear, fox, beaver, large predators including mountain lions, coyotes and bobcats, dozens of small mammal species and a host of birds including cavity nesting birds and raptors.

The west side of the reservoir including Winiger Ridge is considered winter range for elk, although these animals can be found in the area throughout the year. Estimates put the Winiger Ridge winter elk population at more than 270 animals. To insure the protection of this herd, the U.S. Forest Service has imposed a closure of this area to motorized vehicles from December to May. In addition to elk, the area is also winter range for the Boulder mule deer herd.

Forsythe Canyon and Winiger Ridge are part of the wild turkey's overall range. Cavity nesting birds including the northern flicker and hairy woodpecker can also be found. Raptors that can be found include: golden eagles, Cooper's Hawk, goshawk, prairie falcons, red-tailed hawks, American kestrels, and great horned owls.

Studies by the Colorado Department of Wildlife show that rainbow trout is the predominant fish species found in Gross Reservoir. Other less populous species include lake trout, tiger muskie, longnose sucker, and white sucker. CDOW stocks the reservoir with rainbow trout to maintain the population, because there is minimal natural reproduction. The white sucker and longnose sucker populations are not maintained by stocking but reproduce naturally in the reservoir. Assessment of rainbow trout habitat potential for Gross Reservoir rated low to medium,

supporting about 15 rainbow trout per acre. Low trout productivity is due to water depth, cool reservoir temperatures, and fluctuating reservoir water levels (Gross Reservoir EA 1998).

3.2 Site Specific Existing Conditions

This section addresses the natural and visual conditions found at each of the eleven recreation sites.

3.2.1 North Shore Recreation Area *(see Existing Site Character, Map 3)*

The North Shore recreation area is approximately 1,000 feet north and about four hundred feet in elevation above Gross Reservoir. This area is owned and managed by Denver Water. Denver Water's recreation facilities are concentrated in several areas along the south side of Flagstaff Road, covering a distance of roughly 1/3 of a mile. These facilities are perched along the top of a ridge that forms much of the reservoir's northern boundary. Views to the south looking across the reservoir are excellent. Some of the more prominent overlooks afford views to well over half the surface area of the reservoir and provide excellent views to distant mountains.

Moderate to steeply sloping stands of ponderosa pine forest and open woodland characterize the sideslope drainages above the reservoir in this area. There are several deeply-inset drainages where moisture-loving vegetation flourishes. Several prominent rock outcroppings project-out from the surrounding slopes, creating unique landforms.

The exposed location atop the ridge makes this area highly visible and susceptible to strong prevailing northwest winds. Vegetative buffers and screening are lacking, particularly on the east end of the site. Consequently the existing parking area and picnic shelter are located on the most exposed portion of the site.

3.2.2 Peninsula Recreation Area *(see Existing Site Character, Map 3)*

The Peninsula Area is a prominent arm which projects some 400 feet out into the reservoir along the north shore *(see photo 1, page 18)*. This area offers one of the most scenic locations on Gross Reservoir. Most of this land mass is covered with ponderosa pines and surrounded on three sides by water. The slopes are grass-covered and gentle near the top of the peninsula but become rocky and steeper at the water's edge.

The peninsula's highpoint is a flattened knoll in a clearing of trees about 35 feet in elevation above the water's surface (high water). This area offers excellent views of the reservoir from three sides. There are two small coves on either side of the peninsula with gently sloping shorelines. These shorelines are as close as it comes to a "beach" at Gross Reservoir. Furthermore, the eastern cove remains somewhat protected from the high winds coming off the water.

3.2.3 Dam Recreation Area (*see Existing Site Character, Map 4*)

The Dam site is the most visible recreation area on Gross Reservoir (*see photo 2, page 18*). This site can be seen from most locations on the north and west sides of the reservoir. Situated on the east end of the reservoir on a rocky knob adjacent to the 1,000-foot long dam, this area offers a 180-degree panorama of the main body of water.

Due to the exposed nature of the site, northwest winds coming off the reservoir can be extreme and pose a serious threat to small craft. The lack of vegetation and the open character of the landscape affords little protection from the elements.

The Dam Recreation Area is bisected by a plateau that divides the site into two distinct areas. During dam construction, aggregate, used in the production of concrete, was accumulated at the north end of this plateau forming a visible and barren slope of loose and light-colored material extending below the eventual reservoir water level. Locations atop this ridge afford an excellent view of the reservoir.

The flattened area to the west of this ridge is open and gently sloping, becoming steeper near the reservoir. The transition to the natural landscape at the western end of the dam construction zone is distinctly marked by the return to slopes sparsely covered with ponderosa pine.

The area to the east of the ridge is a structured, manmade landscape. A 15-foot high concrete retaining wall supports a flattened bench upon which the parking lot sits. Adjacent to the parking area are the sparsely vegetated and steep side slopes of the ridge. The shoreline adjacent to the dam is very rocky. There's a large rock outcropping at the north end of the site. This rock outcropping serves as a buffer and creates a small protected cove at high water. Within this protected area a small wetland has established

3.2.4 South Boulder Creek Outlet

This site is a popular Class III-IV kayaking run down South Boulder Creek. This run starts about three quarters of a mile below the Gross Reservoir Dam. Depending upon dam releases this creek ranges from a gently flowing stream to whitewater rapids. Typically during the months of June and July Denver Water begins releasing large quantities of water as the customer demands for water increase. Prime kayaking conditions occur on South Boulder Creek as these flows reach the 200 to 450 cubic feet per second (cfs) range. This run becomes significantly more difficult with flows above 450 cfs.

The water released through the Gross Reservoir dam comes straight from the bottom of the reservoir through outflow pipes at its base. As a result, the summertime water temperatures in South Boulder Creek below the dam typically hover around 6 degrees Celsius (42 F).

The creek access point is located several hundred yards below the bridge near the low point of the Gross Reservoir Access Road (*see photo 1, page 20*). The creek runs below the steep slopes at

the base of the road to the north. There's a Denver Water caretaker's residence located along the gently sloping south side. Access to the creek is from the north where a trail drops several hundred feet from the roadside parking down to the put-in. Here the forested slopes screen vehicles and the access trail from the caretaker's residence.

3.2.5 Haul Road Recreation Area *(see Existing Site Character, Map 5)*

The Haul Road Recreation Area is located on the south end on the reservoir approximately 1 mile east of the South Boulder Creek Inlet. This is an area where the narrow South Boulder Creek arm of the reservoir doubles in width, widening to a quarter of a mile. The steep slopes along the reservoir's edge create a protected valley. These sheltered waters are the least susceptible to adverse weather conditions on the reservoir.

With the exception of the lowest 300 feet, most of the road is surrounded on both sides by dense conifer forest. Views to the reservoir only open up near the end of the road.

A narrow cove is situated below the road at the end of a deep drainage. Here the dense tree canopy opens to reveal several small meadows sloping gently towards the reservoir. Only a few of these meadows have open views of the reservoir.

3.2.6 South Boulder Creek Inlet *(see Existing Site Character, Map 6)*

This site is where the natural flows from the South Boulder Creek drainage along with the diverted flows from the west side of the Continental Divide enter into Gross Reservoir. The site is characterized by the abrupt transition of fast flowing rapids to tranquil flat water. This transition has created a unique ecosystem that includes wetlands and extensive shorelines created by river sediment deposits.

The site is located at the bottom of a steeply sloped valley covered with dense conifer forests. All of the land area at this site is managed by the U.S. Forest Service (Arapaho-Roosevelt National Forest).

Views up the river and down into the reservoir are short due to the serpentine form of the valley. The river drops and courses through large boulders and willow-lined banks. The vegetation changes abruptly where the river meets the reservoir as cottonwoods, willows and grasses give way to conifers *(see photo 2, page 20)*.

3.2.7 Winiger Gulch Inlet *(see Existing Site Character, Map 7)*

This site is located where the Winiger Gulch drainage flows into Gross Reservoir about a half-mile north and east of the South Boulder Creek Inlet. Like the South Boulder Creek Inlet this site is located at the bottom of steeply sloped valley which opens up into the reservoir *(see photo 1, page 22)*. Again, all of the land area is owned and managed by the U.S. Forest Service.

A dirt road runs near the bottom of the drainage with several extremely steep roads branching off to adjacent areas.

This site probably has some of the most extensive wetland areas found on Gross Reservoir. The area plays host to an array of waterfowl and bird species. Several significant waterfowl nesting sites have been identified.

3.2.8 Winiger Ridge Access and Recreation Area *(see Existing Site Character, Maps 8 & 9)*

Winiger Ridge is a roughly mile long, half mile wide peninsula that extends east from Gross Reservoir's west side as the drainage divide between South Boulder Creek and Forsythe Canyon *(see photo 2, page 22)*. Although this site is easily seen and appears to be close to other facilities across the water, the area remains one of the more remote locations on the reservoir due to limited and difficult access.

While the entire peninsula falls within the FERC boundary, only the eastern most 1/3 falls under Denver Water ownership. The remainder of the land is owned and managed by the U.S. Forest Service.

Winiger Ridge slopes in an easterly direction towards the dam. Elevations range from 8,500 feet on the west side to 7,287 feet at the reservoir's shoreline (high water). The landscape is a mix of conifer forest, open meadows and riparian areas found along the water's edge. The terrain varies from steep rocky outcrops to the north to relatively flat areas near the top of the ridge.

Fire suppression over the years has resulted in contiguous forest containing dense tree stands with extensive fuels covering the forest floor. These forests are potentially primed for intense and severe wildfires.

Each year from December to May, Winiger Ridge is closed to protect the winter elk herd.

3.2.9 Jumbo Mountain *(see Existing Site Character, Map 10)*

Jumbo Mountain is a day-use picnic and fishing access area located ten miles west of Gross Reservoir near the town of Rollinsville. This narrow site is situated between South Boulder Creek to the north and County Road 16 (Rollins Pass) to the south. The Denver and Rio Grande Western Railroad has tracks located on the north side of South Boulder Creek about 200 feet from the picnic area. This relatively flat site along the creek is in the bottom of a narrow densely forested valley. There are however, few trees to be found within the picnic area. The vegetation is comprised primarily of small willows and grasses *(see photo 1, page 23)*.

According to the U.S. Forest Service, the area has been infested with noxious weeds primarily yellow toadflax.

3.2.10 Rocky Point Area *(see Existing Site Character Map 11)*

Rocky Point is a prominent rock outcrop located southwest of the Lakeshore neighborhood along Gross Reservoir's north shore *(see photo 2, page 23)*. This site is located just within the Roosevelt National Forest. Commonly referred to as Jumping Rock, this large granite outcrop

towers 25 to 50 feet (depending upon the location and the reservoir's water level) above the reservoir's surface. Over the years, this feature has become a popular summertime swimming destination for adolescents and young adults.

The rock formation is situated at the base of very steep south facing slopes below a prominent ridge. The slopes in this area are rugged and sparsely covered with junipers and ponderosa pine. Two more heavily vegetated drainages occur on either side of Jumping Rock. Several stands of cottonwoods can be found near the water's edge.

3.3 Overall Existing Use & Facilities

Currently, the Gross Reservoir area offers a limited number of recreation activities at several locations around the reservoir. These activities include fishing, sightseeing, picnicking, hiking and biking (on Winiger Ridge). Kayaking occurs on South Boulder Creek outside Denver Water boundaries. In addition, Winiger Ridge is open to primitive camping, horseback riding, mountain biking and four-wheeling. Unfortunately illegal activities including swimming and shooting occur on site as well.

Denver Water provides recreation facilities and limited management at four locations around Gross Reservoir: the North Shore, Peninsula, Dam and Haul Road. The U.S. Forest Service manages most of the land on the west side of the reservoir. With certain limitations and restrictions, camping, hiking, biking, picnicking, fishing and off-highway vehicle use on designated roads are all permitted on the National Forest lands.

3.3.1 Existing Recreation

Visitation & Visitor Use

Comprehensive information concerning recreation visitation numbers at Gross Reservoir is not available at this time. Estimates on visitor numbers can be calculated by utilizing what limited information is available. However, without accurate and comprehensive annual numbers, these figures are at best an educated guess. While visitation numbers are difficult to discern, surveys have provided us with a good indication of who is visiting Gross Reservoir and why.

As an informal means of gathering visitor data, Denver Water caretakers recorded the number of cars that were parked at visitor parking areas, as observed during the normal course of operations at various times of day. This data provides a snapshot of the average number of cars that may be parked at any time. By assuming a 1.5 car per day turnover rate, an annual vehicle projection can be made.

Caretaker Car Counts at Gross Reservoir, Plus Assumed Turnover Rate and Vehicle Totals
1999 / 1995*

		Average cars at one time	Assumed turnover rate	Total cars per day	# days	Total cars
Spring	Weekend days	7	1.5	10.5	16	168
Spring	Weekdays	2	1.5	3	40	120
Summer	Weekend days	9	1.5	13.5	34	459
Summer	Weekdays	8	1.5	12	67	804
Fall	Weekend days	5	1.5	7.5	21	158
Fall	Weekdays	2	1.5	3	51	153
Winter	Weekend days	4	1.5	6	45	270
Winter	Weekdays	3	1.5	4.5	91	410
Overall annual avg. or total		4.6	1.5	7.0	365	2,541

*1999 data is used for spring weekend days, summer weekend and weekday days, and fall weekend days. 1995 data is used for all other days.

Source: Denver Water.

By calculating visitor numbers based upon caretaker car counts, a “ball park” annual visitation number can be derived. If we assume 2.7 persons per vehicle visited the reservoir, the annual visitation would be 6,860. Again, without accurate and comprehensive data, this information could be highly inaccurate.

In 1998, a visitor survey was conducted and included in the *Gross Reservoir Hydroelectric Environmental Assessment Volume IV Resource Report**. This survey was conducted over the course of two Fridays (one holiday, one non-holiday) during the summer. Although a sample of two days is too small for the purposes of projecting visitor volumes, it does provide an “order of magnitude” characteristic of summer visitation. It also provided a representative sample to begin understanding who is visiting Gross Reservoir and why.

- During those two days, 260 people visited the reservoir.
- Roughly 37% of the visitors were from Boulder County, the remaining 63% were from the Denver metropolitan area
- Summer weekends accounted for most of the visitation 50%, followed by summer weekdays 30% and fall weekends 10%.
- The most popular activities were fishing 70%, picnicking 40%, hiking 26%, sight-seeing 15%, camping 10% and swimming at Jumping Rock 6%.

* Complete survey results can be found in the Appendix

This past summer (2001), *Gross Reservoir Recreation Management Plan Constituent Social Value Surveys** were completed during the public participation process for this project. These surveys asked participants about their use of Gross Reservoir. The following summary highlights the responses received from 21 neighbors, three recreational users and three agency personnel. (Note: the 21 neighbors are frequent visitors to the reservoir.)

- The neighbors said they visit Gross Reservoir throughout the seasons as often as once per day or at the very least once a month. Non-resident visitors use the facility two to four times per year.
- The most popular activities are hiking, wildlife viewing and sightseeing. A smaller number of visitors participate in camping, picnicking and four-wheeling. Only a few respondents said they participate in fishing, biking, kayaking and equestrian activities.
- The areas identified as the most popular for those activities (in descending order) were: Winiger Ridge, North Shore, Peninsula and then Rocky Point.
- Complete survey results can be found in the Appendix

In the future, comprehensive visitation information will be collected as part of the recreation monitoring program. That program will provide accurate visitor and vehicle counts, in addition to tabulating visitation patterns, resource damage, facility conditions and management practices.

Boating

Currently, Denver Water prohibits boating activities on Gross Reservoir. However, after running the creek from Pinecliff, kayakers continue to use the reservoir from the South Boulder Creek Inlet to the Haul Road.

Fishing

With the exception of the dam, fishing is permitted along the entire shoreline of Gross Reservoir from 4 am until 9 pm daily. State of Colorado fishing regulations apply. Ice fishing is permitted when conditions allow.

Over the years, anglers have developed an extensive network of social trails along the banks of the reservoir. Most of these trails occur within a short distance of the parking areas. However, some of these trails go some distance - crossing ridges and deep drainages to access remote areas on the reservoir. The majority of anglers at Gross Reservoir fish there often and know the area well.

Hiking, Biking, and Horseback Riding

The roads and trails around the reservoir are used sporadically by hikers, mountain bikers and to a lesser degree by equestrians. The trails network on the north and east sides of the reservoir consist of little more than a loose arrangement of social trails, game trails and fishing access trails. The main trail on the north side of the reservoir was built by Denver Water and wasn't designed for sustainable hiking access. In most cases, the trails are poorly developed and difficult to follow. These trails are restricted to hiking use only. The trail system in the Roosevelt National Forest is more extensive. Old logging roads and newly developed (illegal) roads and trails are found throughout the area. Biking and equestrian use of these trails continues to increase.

Camping

Overnight use at Gross Reservoir is not permitted on Denver Water property with the exception of camping on Winiger Ridge. Here, campers have developed dozens of primitive campsites and firerings on Denver Water property and U.S. Forest Service land. Most of the sites occur along Forest Road 359 and along the reservoir shoreline. Many of these sites were merely created by recreationists and have no facilities. The few sites are comprised of little more than a flat clearing and a rock fire-ring. The vast majority of campsites on Winiger Ridge do not blend well with the surrounding environment.

Facilities

Denver Water has provided parking lots, picnic shelters, picnic tables, grills, restrooms, signage and trash receptacles at several locations around the reservoir. These facilities are more than 20 years old and are either approaching or well past their useful life. Many of the picnic tables and grills are in a state of disrepair. In some cases this has more to do with abuse and vandalism by users than it does age or neglect. Plastic molded portable toilets designed for handicap accessibility have been placed in major use areas.

3.3.2 Access and Circulation *(see Map 1)*

Gross Reservoir is located in the Roosevelt National Forest 6 miles southwest of Boulder. The reservoir is accessed by one of four Denver Water (owned and maintained) gravel roads located on the north, east and west: Gross Reservoir Access Road, the Dam Access Road Haul Road, and Forest Road 359. These access roads are reached from three primary (paved) roads: County Road 68 (Flagstaff Road), Magnolia Road and Highway 72 (Coal Creek Canyon). County Road 68 connects the City of Boulder to the north end of the reservoir. Magnolia Road is accessed from Highway 119 (Boulder Canyon) to the north and serves two reservoir access roads (County Rd. 68J and County Rd. 356) on the west end of the site. Highway 72 serves the south side of the reservoir.

The three gravel roads that provide access to Gross Reservoir are approximately 25 feet wide, steep and winding. The roads are characterized by sharp curves and short sight distances. There are several areas where steep drop-offs occur alongside the road. Currently, there are no guardrails along any of these access roads. Although Gross Reservoir caretakers grade the roads as often as once per month (weather permitting), road damage in the form of washboards is present throughout the year.

There are several gravel parking lots serving the recreation areas around the reservoir. These informal parking areas range in size from several spaces up to 50 or more cars. The lack of designated parking spaces leads to haphazard and inefficient parking in some areas. The boundaries of most parking areas are defined by manmade or natural barriers including parking-bumpers, fences, rocks, vegetation and topography. There are several locations, however where vehicles have damaged unprotected landscape areas adjacent to parking lots.

Directional signage around the reservoir is very limited (*see photo 1, page 29*). Currently there are only a few signs located at the North Shore parking lot and near the headquarters building by which a visitor could obtain directions or get their bearings.

With the exception of the North Shore and the Peninsula sites, driving is required to get from one recreation area to another. Currently there's a loosely connected network of social trails providing access to a few fishing areas. However, most of these social trails are difficult to follow and improperly designed, resulting in extensive resource damage.

At this time very few of the facilities at Gross Reservoir have provisions for handicap accessibility.

3.4 Site Specific Existing Use & Facilities

This section addresses the existing use and facilities at each of the eleven recreation sites.

3.4.1 North Shore Recreation Area

Due to the North Shore's proximity to Boulder and convenient access, this is one of the most heavily used areas at Gross Reservoir. The hilltop location and excellent views to the south across the reservoir make this an ideal setting for passive recreation.

Access to the site is from the Gross Reservoir Access Road which ties into Flagstaff Road about 50 yards north of the parking lot entry. The parking facilities are adequate, accommodating up to 50 vehicles. While the layout and functionality seem to work, the location is visible from surrounding areas and has limited screening. The parking lot can be seen from the adjacent Lakeshore neighborhood and from the Dam site across the reservoir.

Located on the north side of the parking lot are four portable toilet facilities. The brown molded plastic shell of these facilities are the first thing one sees when driving up Flagstaff Road (*see photo 2, page 29*). There are several more suitable locations to relocate restroom facilities adjacent to the parking area.

On the south side of the parking lot is a picnic shelter that accommodates two picnic tables. This facility is located at the most prominent overlook site. While this makes for a great picnic location, it doesn't function very well on busy days when folks are trying to take in the view. There are several more appropriate sites to the west for this group picnic facility.

Adjacent to the parking lot are several Denver Water signs, one bulletin style sign posting regulatory information and two routed wood informational signs. The informational signs provide a crude map of the reservoir and ownership and operational information. Denver Water has provided trash and recycling receptacles next to the regulatory signage which detract from the appearance of the site (*see photo 1, page 31*).

About a quarter of a mile west of the main parking lot along Flagstaff Road are two smaller parking lots serving several picnic sites. The site on the far west is comprised of a gravel parking

lot surrounded by post and wire fencing. The parking configuration within this lot is difficult to discern. It appears as though the lot would accommodate three to five vehicles. Presently, there are only two picnic tables with pedestal grills at this location. The other parking lot to the east is substantially larger, as many as seven vehicles can be accommodated here. Each gravel parking space is clearly delineated with a log parking-bumper. Informational signs and portable toilets have been provided. These portable toilets, like those at the main parking lot, are poorly screened and much too close to Flagstaff Road. Again, these facilities dominate the entry to the picnic area. Some of the picnic tables in the area lack screening and have been placed too close to the road. There are several locations to the south that are more appropriate settings for picnicking. In addition, there are several prominent rock outcrops adjacent to these picnic areas that provide spectacular views to the reservoir.

All three of the North Shore picnic areas are connected with a social trail that runs along the top of the ridge. For the most part, the trail is in good shape and is easy to follow.

Unfortunately, the same cannot be said for the myriad of social trails that drop south off the ridge and down the steep slopes towards the reservoir. Over the years the deep drainages that run from the ridge-top down to the reservoir have been overrun with social trails. These trails have resulted in severe erosion and environmental degradation. Some of these drainages have been scoured of all soils and vegetation, exposing bedrock (*see photo 2, page 31*). Estimates put the damaged resource areas at several acres. (*see Articles 401 & 405 Erosion and Rehabilitation Plans for more information*).

3.4.2 Peninsula Recreation Area

The Peninsula site is a prominent feature along Gross Reservoir's north shore. The site is a popular fishing and picnic area because of the easy access to the water. Here the shoreline slopes gently along the banks of the reservoir. The peninsula is bordered on either side by two relatively protected coves. These coves offer one of the best shoreline experiences on the reservoir (*see photo 1, page 32*).

There is no public vehicular access to the Peninsula Recreation Area. Visitors to this site are required to walk a minimum of a quarter mile from either of the three North Shore parking areas. While Denver Water does maintain a narrow access road to their peninsula maintenance facility, this road is not open to private vehicles. Visitors are permitted to walk around the closure gate and down the road to the peninsula area. In addition to the maintenance road, there are several trails connecting the North Shore Area to the Peninsula. Some of these trails are badly eroded social trails while others are more developed and sustainable. Currently there is no ADA access to the Peninsula. If available, Denver Water caretakers can be called upon to open the gate to allow handicapped visitor access.

At the bottom of the access road where the peninsula begins, Denver Water has constructed a large concrete storage facility (*see photo 2, page 32*). The square building has an aggregate finish with two large garage doors. This building houses maintenance equipment and the reservoir's rescue boat. The location of the building makes for easy access to the reservoir. Unfortunately it

occupies one of the more visually sensitive areas of reservoir shoreline. This site is highly visible from the North Shore and other areas on the reservoir and lacks screening.

Adjacent to the maintenance road above the peninsula are two portable toilet facilities of the same plastic construction as those found at the North Shore parking lots. Again these facilities are located in a very prominent location and lack any type of screening (*see photo 1, page 34*).

The facilities on the peninsula consist of several picnic tables and a network of social trails that provide fishing access and linkages to the peninsula highpoint area. The major trail system functions well and is in pretty good shape. Some erosion has occurred on the end of the peninsula just below the highpoint. The peninsula trails tie into the shoreline fishing trails that run west to Rocky Point and east along Gross Reservoir's North Shore. The main trail along the water is gently sloping and extends to the base of Rocky Point.

Additional facilities include regulatory signage and trash/recycling receptacles.

3.4.3 Dam Recreation Area

The Dam Recreation Area is second only to the North Shore in the number of visitors. The area is popular not only among anglers, but among sightseers wanting a close-up view of the 300-foot high Gross Reservoir dam (*see photo 2, page 34*).

The site is reached from the Dam Access Road located on the south side of the reservoir. This gravel road switchbacks around the backside of the ridge area then ties into the large parking lot below. The parking area is situated below the steep slopes of the plateau and atop a fifteen-foot high retaining wall that runs perpendicular to the dam. This unscreened wall becomes a dominant visual feature of the dam area as seen from the North Shore and Peninsula (*see photo 1, page 35*). The parking lot accommodates roughly 50 vehicles. Log parking-bumpers are located along the top of the retaining wall to prevent cars from going over the wall's edge and at the end of the lot to keep cars from encroaching on the shoreline.

While this area is one of the larger recreation sites at Gross Reservoir, it offers few facilities. Currently there is a shelter with two picnic tables, two portable toilets, regulatory signage and some trash/recycling receptacles. The toilet facilities are located at the base of the plateau adjacent to the parking area. Log parking-bumpers protect the toilets, yet they remain unscreened. Due to the high northwesterly winds coming off the reservoir, at some point it was necessary to add a three and a half foot stone wall to the picnic shelter. This shelter is located near the windiest end of the point and is oriented perpendicular to the prevailing winds so it is highly exposed (*see photo 2, page 35*).

The trail system at the Dam Recreation Area is fairly simple due to the confined layout of the site. A social trail connects the end of the plateau to the lower shoreline trail. Several rocky trails follow the water's edge. Fishing access is quite good during high water (7,280 ft.) and ADA access is feasible. As the reservoir drops in elevation, however, the banks along this site become very steep. Cliffs begin to form on some of the rocky outcrops adjacent to the dam.

3.4.4 South Boulder Creek Outlet

This section of South Boulder Creek is at times a very popular recreation area. During peak runoff in the late spring, when Gross Reservoir is releasing large quantities of water, this stretch of river becomes a popular Class III-IV kayak run. To a lesser extent, the creek attracts anglers throughout the year.

The kayak put-in is located about three quarters of a mile below the Gross Reservoir Dam, along the Gross Reservoir Access Road on Boulder County Open Space land. There are no designated parking facilities in this area. However, a dirt pull-off exists along a sharp turn in the road. This pull-off can accommodate 2 vehicles. Most visitors elect to park along the road at this location. In some instances, visitors park on either side of the bridge or along the dam maintenance road, even though Denver Water has posted signs strictly prohibiting parking in these areas.

In addition to restricting the parking, Denver Water prohibits boaters from going over the gauging station located several hundred yards below the bridge. This gauging station is comprised of an elevated weir and a small building that houses instruments that record flows (*see photo 1, page 37*). Denver Water has concerns not only about the safety of the four-foot weir, but the effect kayaks could have on the instrument readings. As a result, Denver Water has posted signs requiring all boaters to put-in below the gauging station.

Trail access below the gauging station has been provided a quarter of a mile up the road. This trail requires boaters to drop-off their gear in a clearing at a bend in the road, then drive down to park their vehicles along the road. From this bend in the road, the trail drops several hundred feet to the creek below. The trail is steep and difficult to negotiate, particularly when carrying a kayak. These inconveniences have encouraged kayaker disobedience to Denver Water regulations, they simply launch their boats below the bridge and float over the gauging station.

3.4.5 Haul Road Recreation Area

The Haul Road provides the easiest access to the water of any of the sites on Gross Reservoir. People in wheelchairs are capable of gaining access to the reservoir at most water levels. It also offers one of the few relatively safe locations from which to launch a boat.

The road is built upon a bench that was cut into the steep north-facing slope along the reservoir. This road maintains a fairly consistent 5 to 8 percent grade from its intersection with Gross Dam Road, extending several hundred feet into Gross Reservoir (during high water). This informal road provides good access, regardless of the reservoir's water level (*see photo 2, page 37*).

Unfortunately, the narrow bench upon which the road sits affords little space for parking and provides limited space in which vehicles may turn around. The area at the end of the road is not suitable for vehicles pulling trailers. The backslope along much of the road is bedrock - exposed during construction. Along the lower part of the road, the shoulder is little more than a grass strip, beyond which are steep drop-offs. In some areas, log parking-bumpers line the steep drop-offs. Some of the bumpers are sliding down the slope as a result of erosion and vehicle damage. Currently, most of the parking occurs at the end of Haul Road. Here the roads widens enough to

park a dozen or so vehicles perpendicular to the road. When this site fills up, which it often does in the height of the season, parking or even turning a vehicle around can be difficult. In this case, visitors must back-up the road, then attempt to parallel park.

Denver Water uses this area for rescue boat access during low water. Due to the restricted space they must turn the boat trailer around several hundred feet from the waters edge and back up to the water. They maintain an emergency access gate at the end of Haul Road. Metal bollards restrict vehicular access on both sides of the hinged gate. This gate provides boat access to the reservoir in the event of an emergency. Due to the confined parking area at the end of the road, the gate is often blocked when the parking lot is full.

With the exception of portable restrooms and one picnic table, few facilities are provided at the Haul Road. These restrooms are located at the intersection of Gross Dam Road and Haul Road and at the bottom of Haul Road several hundred feet from the parking area. The toilets are the standard molded plastic porta potty found throughout the reservoir. The toilets located at the intersection are rarely used and create an eyesore in such a prominent location (*see photo 1, page 39*). The toilets near the parking area are unattractive and lack screening.

This area has been a popular fishing destination for years. Fishing occurs on the rocky beach area and along the steep 20 feet of shoreline between the reservoir and the road. These banks are severely eroded and what little vegetation remains is being undermined as soil continues to slough (*see photo 2, page 39*). There are no established fishing access trails in this area.

The South Boulder Creek Inlet trail begins at the end of the Haul Road. This trail is a social trail established by anglers to access the inlet. Located adjacent to a standard regulatory sign, the trailhead bears no identification. Here, the trail starts up a severely eroded natural drainage between two rock outcrops. For the first hundred feet or so the trail follows the bottom of the drainage. Further up, it starts to traverse steeply up the slope. The steep grades and poor alignment have resulted in severe erosion. In some places the tread has become a deep swale.

For years, the Haul Road Recreation Area has been used illegally as a takeout for kayakers. After boating down South Boulder Creek from Pinecliffe, Gross Reservoir provides the only takeout in close proximity to a road. This takeout requires kayakers to illegally paddle a mile and a half of reservoir back to their vehicles at Haul Road.

3.4.6 South Boulder Creek Inlet

Although not easy to reach, this is one of the most prized fishing locations on Gross Reservoir. South Boulder Creek provides a fresh supply of nutrients for the fish population in the reservoir. As a result, fish gather here to feed in the waters of the inlet. Tiger muskie in particular, get quite large feeding on the small trout that are flushed into the reservoir.

This location also marks the terminus of a Class V and VI kayak run, which starts three miles upstream in Pinecliffe. This section of creek is best run from mid May to early July when flows are in the 150 to 400 cubic feet per second range. This tricky stretch of creek is beyond the capabilities of most kayakers, so their numbers remain low. While boating on the reservoir is

illegal, kayakers arriving here have few alternatives. The alternatives are: hike several miles with their kayak up and over ridges on the anglers' trail, or paddle the mile and a half to Haul Road. Most of the kayakers elect to paddle.

3.4.7 Winiger Gulch Inlet

This is one of the lesser-used recreation areas at Gross Reservoir. Access to this area is limited because of private land. Some fishing occurs although this requires a two-mile walk from the closure gate on Winiger Gulch Road. In addition to fishing, hiking, biking and horseback riding are permitted on the access road. This makes for a nice trip to and from the reservoir.

Four-wheel drive enthusiasts from Winiger Ridge often end up on the Winiger Gulch Road after following the steep social roads that drop into this area. The closure gate on Winiger Gulch Road bars access out of this area, forcing drivers to return to Winiger Ridge by driving up the steep roads. The U.S. Forest Service has proposed to create a Travel Management Plan to analyze the roads and visitor use in this area. This plan will be initiated when funding allows and will determine which of these social roads to close.

Within the Winiger Gulch Inlet are several sensitive riparian areas. These areas should be protected. This protection should include informational signage and closure of the riparian areas, in addition to prohibiting boats from landing on this resource.

3.4.8 Winiger Ridge Access and Recreation Area

Winiger Ridge provides excellent access to Gross Reservoir from a relatively remote location. This site on the west end of the reservoir is accessed via Forest Road 359 and County Road 68J. High clearance vehicles are necessary to access the ridge from Forest Road 359 immediately beyond the parking lot.

A dirt parking area that can accommodate 12 to 15 vehicles exists at the intersection of 359 and 68J. This area sits in the bottom of a large drainage. As a result, significant erosion problems occur within the parking lot. The center of the parking lot has become channeled and scoured of soil.

Much of Winiger Ridge lies within the FERC boundary. Denver Water owns and manages the eastern end of the ridge, while the U.S. Forest Service manages the western end and most of the adjacent land area.

Use of motorized vehicles is permitted from May through November in this area. During the remainder of the year, this site remains closed for the protection of wintering elk. Hiking, biking and equestrian access is available year-round. During the winter visitors can park at the lot at 359 and 68J.

Within this area are numerous multi-use trails. The area has been a popular hiking destination for years. Mountain biking has seen a significant increase lately. Equestrian users primarily from the Magnolia Road neighborhoods use these trails extensively.

Overnight use is permitted on Winiger Ridge. Over the years, visitors have developed dozens of primitive campsites on Denver Water property and U.S. Forest Service land. Most of the sites occur along 359 and along the reservoir shoreline. These sites are comprised of little more than a parking space, a clearing and a rock fire ring. In some areas, poorly located and difficult to access campsites have caused extensive environmental damage.

This area is a popular destination for four-wheel drive enthusiasts. Numerous temporary logging roads and recently developed (unauthorized) four-wheel drive roads can be found throughout the area (*see photo 1, page 42*). This use has resulted in severe resource damage in some areas. Motorists driving off designated roads have caused significant erosion on some of the steeper hillsides and within seasonal drainages. The U.S. Forest Service is preparing a Travel Management Plan to study the roads and visitor use in this area.

In addition to the environmental damage, dangerous or illegal activities have been an increasing problem. The site's remote location, ease of access and lack of law enforcement has allowed illicit activities to proliferate, including the discharge of firearms and unregulated fires. These activities have been cause for great concern for the Forest Service and area neighbors.

3.4.9 Jumbo Mountain

Jumbo Mountain provides day-use picnic facilities and fishing access on South Boulder Creek. The site is comprised of a two-way loop road and six parking spaces that serve five picnic sites along the creek. Boulders and log parking bumpers have been used to delineate the road and parking areas. Each picnic site includes a wooden picnic table, a metal fire-ring and a pedestal grill (*see photo 2, page 42*). Some of these facilities are in a state of disrepair. Presently, there are no restroom facilities located on-site.

An interpretive sign providing information on the Moffat Tunnel is located adjacent to the parking area.

The sites located directly adjacent to the river's banks have experienced extensive erosion. Some of these facilities are in jeopardy of being lost if the erosion problems are not mitigated.

3.4.10 Rocky Point Area

Rocky Point has been a popular destination for teenagers and young adults for many years. This area sees the greatest concentration of use on the reservoir, all of which is unregulated. These rocky cliffs along the reservoir have become a major gathering spot for dozens of illegal swimmers throughout the summer. There have been reports of over 300 people gathered on these rocks on busy holiday weekends. Not everyone chooses to jump from the 25- to 40-foot cliffs into the frigid water; some are there to "hang out" and party.

While Denver Water strictly prohibits swimming or body contact with the water of any type on Gross Reservoir, there's nothing illegal about gathering at Rocky Point and the Forest Service does not restrict use. This site lies entirely within the Roosevelt National Forest.

The intermittent illegal body contact with the water is a management concern. Several jumping fatalities and dozens of rescues have occurred over the years. In addition, the area has become a haven for underage drinking and drug-use. In more recent years, this site has experienced a steady increase in all types of crimes. The lawlessness has escalated from littering, trespassing, vandalism and theft to violent crimes including rape and assault.

Visitors to this site park at the end of a dirt road located on the south side of County Road 68J. Parking occurs on a site disturbed during construction of a pipeline. The parking area is often overrun with vehicles, resulting in the necessity for visitors to park along access roads and in front of driveways in the adjacent neighborhood. All the nearby roads are posted “no parking” and are fenced off in places. Conflicts between neighbors and visitors continue to increase and law enforcement problems have escalated. Recently the tires of law enforcement vehicles have been slashed.

In addition to the social problems, environmental resource damage has been severe in some areas. Fences have been removed by visitors in sensitive resource areas to accommodate additional parking. An array of social trails between the parking lot and the cliffs has resulted in severe erosion and environmental degradation.

3.5 GROSS RESERVOIR RECREATION MANAGEMENT PLAN EXISTING CONDITIONS

Federal Energy Regulatory Commission (FERC) No. 2035-006

SITE	EXISTING FACILITIES		
	<i>Parking</i>	<i>Picnic</i>	<i>Other</i>
1. North Shore Recreation Access	40 Cars Unpaved Lot	1 Shelter/ Picnic Site 2 Dev. Picnic Sites	<ul style="list-style-type: none"> • Portable (2) Toilets • Viewpoint • Trailhead to Reservoir • Social Trails • Directional Signs • Gated Emergency Access Rd • Toilet (handicap access.)
2. Peninsula Recreation Area		1 Picnic Area 3 Dev. Picnic Sites	<ul style="list-style-type: none"> • Social Trails • Fishing • Boat House
3. Dam Recreation Access	80 Cars Unpaved Lot	1 Shelter/ Picnic Site	<ul style="list-style-type: none"> • Fishing Access • Viewpoint • Social Trails
4. South Boulder Creek Recreation Access (Outlet)			<ul style="list-style-type: none"> • Social Trails
5. Haul Road Recreation Access	30 Cars Unpaved Lot	1 Dev. Picnic Site	<ul style="list-style-type: none"> • Toilet (handicap access.) • Trailhead • Viewpoint • Boat Access Ramp (on lower road past gate) • Social Trails
6. South Boulder Creek Inlet Recreation Access		Picnicking	<ul style="list-style-type: none"> • Fishing • Social Trails
7. Winger Gulch Inlet Recreation Access	Limited Parking Unpaved lot		<ul style="list-style-type: none"> • Fishing Access • Social Trails
8. Winger Ridge Access & Recreation Area (West & East)	Parking +/- 10-15 Spaces Unpaved Lot		<ul style="list-style-type: none"> • 4WD Access • 6 Camping Sites (near Res.) • 4 Camping Sites (on Forest Road) • Fishing • Trailhead
9. Jumbo Mountain Picnic Area	+/- 7-10 Parking Spaces Unpaved Lot	3 Dev. Picnic Sites	
10. Rocky Point/ Jumping Rock	Unpaved Lot located across RD 66J		<ul style="list-style-type: none"> • Social Trails

3.7 Fiscal and Budgetary Plans

General Management and Budgeting Procedures

Most recreation-related operating activities at Gross Reservoir are authorized and paid for by the Operations and Maintenance branch of the Denver Water Department. There is no separately-established budget for recreation-related operations at Gross. Time is allocated to recreation as judged appropriate by caretaker staff. It is recognized that there is a “gray area” with respect to some activities at Gross that could potentially be classified as either operations-related or recreation-related, such as repair of vandalized facilities. There are no written rules for allocating time to recreation, but caretakers use their best judgment to accurately reflect the actual allocation of time to recreation.

Recreation-related capital projects such as sign replacement, picnic tables, fire rings, and bathrooms are authorized and paid for by Denver Water’s recreation section. In addition to being involved in capital projects, recreation staff also is involved in intergovernmental issues at Gross that involve contact with other governmental agencies.

As of September 2001, on a Denver Water-wide basis, Waterton Canyon was the only Denver Water site where the Denver Water recreation staff was responsible for day-to-day recreation operations. Colorado State Parks manages recreation activities at Elevenmile Reservoir, and recreation activities at Dillon Reservoir are managed through a consortium of agencies. At most or all other Denver Water facilities, it is believed that Denver Water Operations and Maintenance is responsible for on-site recreational management.

Recreation-Related Operations at Gross

Based on conversations with caretaker staff, the primary recreation management activities that are currently undertaken at Gross are cleaning and maintenance. In the summer, with the aid of a seasonal helper (in 2001), cleaning and maintenance is typically done five to seven times per week. In the off-season, cleaning and maintenance is done less frequently in the normal course of operations, typically once or twice per week.

Equipment used in cleaning activities includes a pickup truck with a mounted sprayer, for cleaning restrooms and picnic tables. In addition, the Denver Water boat is used for cleaning frequently-visited areas such as Jumping Rock.

On a less frequent basis, Gross’s outhouses are pumped out twice a year, typically in the fall and spring, by a contractor. In addition, painting is typically done once every spring.

Other common management activities include bumper rail parking maintenance, cutting/spraying weeds, dealing with problems on the lake (e.g. illegal boaters) and other unlawful activity (especially vandalism and trespass), and minor projects such as trail construction, revegetation, and putting up signs. Costs associated with the grading of roads and parking lots is typically allocated to operations although these facilities also serve visitors. Major construction projects such as building new bathrooms are typically contracted out.

In addition to utilizing Denver Water staff and private contractors, Denver Water has also contracted with the Boulder County Sheriff's Department to provide law enforcement services from time to time. Denver Water also has arrangements with local fire districts for emergency services.

Average Monthly and Annual Recreation-Related Expenses

The following table shows recreation-related expenditures paid by Denver Water for Gross Reservoir over the 32-month period between January 1, 1999 and September 5, 2001. The data is based on Denver Water accounting statements. The table includes average monthly and average annual expenditures. It should be noted that the expenditures shown in the table are only a partial representation of existing recreation-related expenditures at the reservoir, for the following reasons:

- *Boulder County Sheriff off-duty expenses are likely understated.* It is likely that Boulder County Sheriff off-duty expenses have been in the range of \$5,000 - \$15,000 per year. However, in the table below, payment to the Boulder County Sheriff is only reported for 1999 through October, in the amount of \$3,742.25. No off-duty Sheriff expenses are reported in 2000 or 2001.
- *Addition of a summer seasonal helper in 2001.* A summer seasonal helper was hired to assist Gross's Caretaker staff in 2001. The summer seasonal helper's primary job was recreation based, including inspecting and cleaning recreation sites, as well as weed control and other duties as required and time-permitting. Summer 2001 recreation-related labor expenses were consequently higher than in previous years as a result of this change. As a result, the average monthly and average annual figures shown in the table below may understate the existing base line, since there was no summer seasonal help in 1999 and 2000.
- *Assignment of expenses as "recreation-related."* As noted above, a 'gray area' exists between expenditures that are allocated to recreation and expenditures that are allocated to operations and maintenance, such as responding to illegal activity and regular road grading. Some expenditures that are largely allocated to operations (e.g. road grading) also serve visitors; recreation costs would likely be higher if such expenditures were allocated to recreation.

Bearing in mind that the figures are thus understated, Denver Water is estimated to have spent an average of approximately \$19,000 per year on recreation-related activities and facilities, or an average of approximately \$1,600 per month, based on expenditures over the 1/1/99 – 9/5/01 period, and excluding 2000 and 2001 Boulder County Sheriff expenses. Approximately 69 percent of expenditures were associated with labor and benefits, with the remaining 31 percent going towards contracted services, materials, vehicle overhead, machine overhead, warehouse overhead, and other items. Denver Water staff have spent an average of 43.4 hours per month working on recreation-related activities over the 32-month period, which translates into approximately 0.25 FTE on a year-round basis. Note that these figures include labor expenses by off-site Denver Water recreation staff working on Gross Reservoir recreation issues.

IV. RECOMMENDATIONS

4.1 General Recreation Recommendations

The recreation improvements described in this section address the facilities required for FERC licensing and the key issues identified during the *RMP* development process. With the exception of picnicking, all of the recreation improvements stipulated in the FERC document have been provided for at each of the 11 sites. After careful site analysis, it was determined that the number of picnic sites required in some areas exceeded the number appropriate for the site. In these cases, the additional picnic sites were provided at alternative locations as informal sites (no picnic tables) on attractive rocky outcroppings.

The recreation facilities provided for in the *Recreation Management Plan* were developed in accordance within the following parameters:

- Parking is permitted only in designated parking spaces and will not exceed 100 spaces.
- Non-motorized car-top boating will be permitted only at designated launch sites.
- All of the recreation areas with the exception of Winiger Ridge will be for day-use only.
- Camping will be permitted only in designated campsites on Winiger Ridge within the FERC boundary.
- Fires are permitted only in designated fire rings.
- Leashes are required for all pets.
- Swimming or body contact with the water is strictly forbidden.

In addition to these parameters, several design considerations were incorporated into each of the recreation areas. These include.

- Designated accessible parking spaces will be provided at all major recreation areas. These parking spaces will measure 12' x 20'.
- Non-accessible parking spaces will measure 10' x 20'.
- All parking spaces will be clearly delineated with a log parking-bumper.
- Boulders (a minimum of 3-1/2' x 2-1/2') will be used as traffic control devices in parking areas and along some roads to protect sensitive resources. These boulders will be spaced so that vehicles can't drive between them.
- All major parking areas will be designed to accommodate access for emergency vehicles. Gates will be provided as necessary for emergency vehicle access.
- Along long stretches of road, post and wire fences will be used as traffic control devices (*see photo 1, page 49*).
- Fee stations will be provided at all major parking areas within the FERC boundaries. These fee stations will include an envelope dispenser and a metal deposit tube.
- All restroom facilities and designated picnic sites will be accessible.
- All facilities will be constructed of materials appropriate for the location.
- Restrooms will be standard Denver Water vault type of formed concrete construction (*see photo 2, page 49*).

- Picnic shelters will be standard Denver Water type made of wood and steel roof construction. Roofs will be painted forest green to blend with surrounding landscape. Each shelter will include two picnic tables (*see photo 1, page 50*).
- Matching Pilot Rock site furnishings will be used at all recreation areas. These furnishings will include: picnic tables, pedestal grills, fire rings and trash *receptacles* (*see photo 2, page 50 and photo 1, page 52*)
- Bear-proof trash receptacles will be provided at the appropriate areas (*see detail 5*).
- A uniform signage program will be established throughout the recreation area.
- Group picnic facilities will separated from individual picnic sites wherever possible.
- All facilities will be located and screened in a visually-sensitive manner.
- All screening vegetation will be indigenous plant species and will blend with the surrounding environment.
- No facilities will be provided along the reservoir shoreline at an elevation below 7,284 feet (two feet above the high water mark).
- All trails will be designed not to exceed 15% grades wherever possible.
- Efforts will be taken to minimize impacts to wildlife habitats and to provide uninterrupted corridors for movement. Roads, trails and fences will be designed and located in a habitat-sensitive manner.

4.2 Site Specific Recommendations

This section addresses the site-specific improvements proposed at Gross Reservoir. With the exception of select road and social trail closures, all of the existing legal recreation activities at the reservoir will be accommodated in the new plan.

4.2.1 North Shore Recreation Area (*see Map 12*)

All of the FERC recreation requirements have been met on this site..

The North Shore Recreation area will function and provide the same recreation experiences as it does currently. However, new facilities will be added and the locations of existing facilities will be changed so as to allow better site organization and to provide appropriate settings for each activity.

The parking lot will remain in its existing location. Parking bays and individual parking spaces will be upgraded to regulation design standards and will accommodate 40 cars, plus two handicapped spaces. Each parking space will be clearly identified with a log parking-bumper. Areas along the edge of the parking lot where parking does not occur will be lined with boulders. At the west end of the parking lot, a drop-off and emergency vehicle turnaround will be provided. This one-way, 80-foot diameter circle will provide emergency access and turnaround capability in the event the parking lot is full. The interior and exterior of the circle drive will be lined with boulders and planted with native species.

The existing portable toilets will be removed from the north edge of the parking lot. This area will then be planted with ponderosa pine to screen the parking. These trees should be spaced to resemble naturally occurring groups, similar to those found on the adjacent hillsides.

New men's and women's restrooms will be provided at the west end of the parking lot. These facilities will be screened with native plant species. A 48-inch wide crusher-fine trail will link the restroom facilities with the parking lot and the North Shore trail system.

The existing picnic shelter will be removed to provide space for a new North Shore overlook. This accessible overlook will be located at the top of the prominent rise overlooking the reservoir. Here interpretive signage will educate visitors on Gross Reservoir's history, facts and natural environment. This overlook will be served by a 36-inch wide crusher-fine trail. A new group picnic shelter will be located just to the west of this area in a less prominent location. This shelter will continue to offer excellent views and will be easily accessible from the parking area.

A new trailhead linking the North Shore to the Peninsula will be provided at the southeast corner of the parking lot. This trailhead will include signage, a fee station, trash receptacles and a 911 emergency telephone. The 36-inch wide natural surface trail will incorporate existing social trails and new sustainable trail alignments. The exact location of this alignment has been flagged in the field. This trail has been designed not to exceed a 15% grade. Drainage structures will be provided at all necessary locations. All social trails not incorporated in the new alignment will be closed and restored. Drainages damaged as a result of these trails and ensuing erosion will be restored (See Erosion Control and Restoration Plan section 4.4.2).

A new closure gate will be provided at the top maintenance road just east of the parking lot.

At the west end of the parking lot, a new trail system will link a series of ridge-top picnic sites. About 200 feet west of the main parking lot, a new loop trail will branch-off to the left. This new trail will serve six formal and informal picnic sites located within the gently sloping conifer forest and along the rocky ridge leading to the prominent reservoir overlook. The formal picnic sites will include a picnic table on a roughly 15' x 15' flattened area - surfaced with crusher-fines. The informal picnic sites will be in select locations within the rocky outcrops with excellent views to the reservoir (*see photo 2, page 52*). Pedestal grills will only be provided at picnic sites adjacent to parking lots.

The existing North Shore trail will continue to follow the ridge up to the rounded highpoint knob, roughly halfway between the main parking lot and the western most picnic sites. Here another group picnic site will be provided under the large ponderosa pines. Due to this site's visibility and prominent location, no shelter will be provided. The site will include three picnic tables on a crusher-fine pad.

The two outlying parking areas to the west will be closed to all vehicles except maintenance. This closure is intended to discourage continued use of Rocky Point after the main parking lot along County Road 68J is removed. Post and wire fencing including signage will be installed along the south side of Flagstaff Road. Both parking areas will be revegetated and restored to their natural condition.

The existing picnic sites in these two areas will be relocated further south along the ridge (*see photo 1, page 55*). This new location will provide more appropriate picnic settings with views to Gross Reservoir. The existing restrooms will be removed and a new facility will be relocated in one of the current picnic sites. This location is further removed from Flagstaff Road and provides better opportunities for screening. A short section of the existing parking lot will remain open for maintenance access. A closure gate will restrict private vehicular access to this area.

All the formal picnic sites in this area will have picnic tables and pedestal grills on a crusher-fine base. Additional ponderosa pines will be incorporated to screen these areas from the road. Informal picnicking will occur on the rock outcrops along the ridge. The social trail connecting the two picnic areas will be improved.

Located between these picnic sites, a second trail will connect the North Shore to the Peninsula. This trail will continue on to Rocky Point following existing shoreline fishing trails. The proposed alignment drops down, traversing the deep and badly eroded drainage beneath a prominent rock outcrop. Efforts were made to keep trail grades at less than 15%. In some areas, steps, low walls and other structures will be necessary to hold the slope and maintain sustainable grades. Badly damaged areas within this drainage will be restored (See Articles 401 & 405 *Erosion Control Plan and Restoration*). The entire trail alignment has been flagged in the field.

In order to deter illegal parking, the entire length of Flagstaff Road between the Gross Reservoir Access Road and the Lakeshore neighborhood will be fenced and posted with “no parking” signs. The signs will employ stern language and convey strict penalties for violators.

4.2.2 Peninsula Recreation Area (*see Map 13*)

All of the FERC recreation requirements have been met on this site.

Due to the peninsula’s prominent location, attempts were made to minimize the visibility of new facilities. In most cases, these facilities are located in the densely canopied portion of the forest. Although little could be done to screen the newly constructed maintenance building, new plantings will be incorporated to soften that back façade. The back of the building is highly visible from the reservoir.

The peninsula area can be accessed by foot from either of two routes. The existing maintenance road will remain open to hiking. In addition, a new and sustainable trail alignment connecting the Peninsula to the North Shore parking area will be provided. This trail ties into the maintenance road just above the peninsula.

Two group picnic sites have been provided along the east cove adjacent to the peninsula. Only one of the two group sites will have a shelter. This shelter will be located within an existing stand of trees screening it from both the North Shore and the reservoir. A 24” natural surface trail will provide access to these sites from the peninsula and the maintenance road above. All of these trails have been flagged in the field.

The portable restroom facilities located in the open meadow above the peninsula will be removed. New restroom facilities will be located behind the maintenance building within a grove of trees. This relatively screened site provides a central location in the peninsula area.

The peninsula itself will provide settings for seven individual picnic sites. These sites will be located high on the flatter, more sustainable portions of the slope. Each of the sites will have a picnic table and pedestal grill on a crusher-fine base. Several additional picnic sites will be located along the reservoir shoreline just to the north of the peninsula. These sites will be located in appropriate settings and properly screened.

For the most part, the existing trail system on the peninsula works in its present configuration. There are a few areas where rerouting would make the tread more sustainable. The addition of a few structures would alleviate some of the minor erosion problems. Fishing access will be provided along the shoreline on existing trails.

The large beach on the north side of the peninsula will serve as a launch site for boaters electing to hike in from the North Shore. The gently sloping gravel beach is accessible at most water levels, and the small cove is one of the few relatively protected areas on the reservoir. Adjacent to the beach along the maintenance road, trash receptacles and regulatory signage will be provided. All of these facilities will be located in a manner that enables unimpeded access to the reservoir for an emergency rescue boat.

4.2.3 Dam Recreation Area (*see Map 14*)

All of the FERC recreation requirements have been met on this site.

Upon implementation of the proposed improvements, the Dam Recreation Area will become the most developed of the recreation sites on the reservoir. This location will provide picnicking at 20 individual sites and three group sites.

The upper parking lot located on top of a flattened ridge, will accommodate 13 cars (*see photo 2, page 55*). The one-way circular configuration utilizes existing traffic patterns. Centered within this parking circle is a large and stately grove of cottonwood trees that will remain the monarch of the upper ridge area (*see photo 1, page 57*). The island around the tree and the adjacent parking area will be lined with boulders. All of the parking spaces will be clearly delineated with log parking-bumpers.

An overlook with interpretive signage will be located at the prominent vista at the west end of the plateau. This location affords a 180-degree panorama of the reservoir. This overlook will be connected to the upper parking lot with a 36-inch crusher-fine trail. Located along the sides of this trail will be several individual picnic sites. Vegetative buffers will be provided to visually screen the sites and to protect them from the strong winds coming off the reservoir. Natural groupings of native plant material will be utilized for these buffers.

The barren slope on the south side of the plateau will be developed as a major picnicking location. Two group shelters and seven individual picnic sites will be developed at this location.

The group shelters will be conveniently located near the parking lot and in the same general area. The individual sites are located in more secluded settings. All of sites will have picnic tables and pedestal grills on a crusher-fine base. The picnic sites in this area will be heavily buffered, particularly on the north and west sides (due to prevailing winds).

A new restroom facility will be located just south of the parking lot. This location is not only convenient for visitors, but makes the restroom easy to service from the road above. The setting for this facility also provides natural screening in the form of rock outcrops. Additional screening along the road and adjacent to the restroom will be provided.

All of the facilities will be linked with a 36-inch crusher-fine trail network. This network will connect the sites to several spine trails serving the parking lot and the reservoir shoreline. At select locations throughout this area, restoration and revegetation efforts will be undertaken to soften the impacts of earlier dam construction (See Article 405 *Rehabilitation and Restoration Plan*).

The parking on the north side of the ridge will remain in its existing location. However, in order to allow for more space for recreation facilities, the parking lot will be pulled back approximately 100 feet east of its current location. This configuration will provide space for restrooms, four individual picnic sites and will dramatically improve the visual appearance of the reservoir. Like the North Shore parking area, this 28-space lot will incorporate a one-way drop-off that can be utilized for emergency vehicles. All of the parking spaces will be clearly designated with log parking-bumpers. Boulders will provide traffic control along the edges of the lot. Naturally spaced trees will screen areas of high visibility.

An accessible 36-inch crusher-fine trail will connect the parking lot to a fishing access trail along the shore of the reservoir. During periods of high water, provisions will be made to accommodate fishing from a wheelchair along this trail. Unfortunately, the banks of the reservoir are much too steep to provide access at low water. However, accessible fishing will be available during all seasons at the Haul Road.

Several additional picnic sites will be located along the reservoir's shoreline and below the concrete retaining wall supporting the parking lot. The picnic sites adjacent to the reservoir will be nestled into the protected areas of the large rock outcrop (*see photo 2, page 57*). These should be some of the more attractive picnic locations on the reservoir. Natural screening will be incorporated to soften the appearance of the concrete retaining wall.

The highly visible talus slope located at the west end of the plateau will be visually softened with large boulders. These boulders will be placed into the aggregate to break-up the uniform and unnatural appearance of the slope (See Article 405 *Rehabilitation and Restoration Plan*). A natural surface trail connecting the overlook to the recreation areas on either side of the plateau will be incorporated into this slope.

4.2.4 South Boulder Creek Outlet (*see Map 15*)

All of the FERC recreation requirements have been met on this site.

While less than ideal, parallel parking along the Gross Reservoir Access Road above the bridge was determined to be the safest and least likely to interfere with Denver Water operations. When combined with a new trail, this parking location provides the best access to the creek below the gauging station.

Along this stretch of road, ten parallel parking spaces will be provided on the south shoulder. Two groups of five spaces will be located on either side of a new South Boulder Creek Outlet Trailhead. Each parking space will be approximately 8' x 20' and will be delineated with a log parking-bumper. Boulders will be located along the road to discourage drivers from parking in undesignated areas.

The new trailhead will provide better access to the creek below the gauging station. This alignment is located lower on the road and will require less elevation gain to get access down to the creek. The trail will be designed at 15% grades and will include several switchbacks. The trailhead will include regulatory signage and a trash receptacle.

Upon abandonment of the old trail alignment, proper trail closure and revegetation should be implemented. Duff and other materials removed during new trail construction should be dispersed along the old trail. In addition, the old tread should be scarified to promote the establishment of new vegetation.

4.2.5 Haul Road Recreation Area *(see Maps 16 and 17)*

Haul Road was the one location at which the FERC recreation requirements could not be met on site. Only nine of the twelve required picnic sites could be accommodated. This site had neither the space nor the appropriate settings for the remaining three sites. An alternative location for these picnic sites was found east of the dam at a prominent rocky overlook along the Gross Reservoir Access Road (Site 5a on the Gross Reservoir Site Plan, Map 2). Three parking spaces located on the west side of the road currently serve these informal picnic sites.

While access is good, the deeply inset road cut doesn't provide many opportunities for parking near the reservoir. Exposed bedrock abuts much of the road's backslope along the shoulder. The outslope shoulder is either badly eroded or non-existent.

Despite the less than ideal parking situation, three separate parking areas have been provided along the Haul Road. The three lots accommodate a total of 20 cars plus two accessible spaces. The parking lots are spaced approximately 400 feet apart at the beginning, the middle and at the end of Haul Road.

To provide the best possible access to the reservoir, vehicles will be permitted to drive to the closure gate near the shoreline of the reservoir. Here, a 65-foot diameter turnaround with two temporary loading/unloading parking spaces will be provided. In order to accommodate this turnaround, a 10 to 15-foot cut into the bedrock backslope will be necessary. The rock extracted here will be used to fill 10 to 15 feet on the reservoir side of the turnaround. The reservoir side of the turnaround will be lined with boulders, spaced to provide a safety barrier.

Adjacent to the turnaround, three picnic sites will be provided along what is now the north shoulder of the road. The last 500 linear feet of the end of Haul Road will be narrowed from 35 feet down to 24 feet. This reclaimed road area will provide the setting for these picnic sites. These sites will be perched along the steep slopes 10 to 20 feet above the reservoir. Log railings and boulders will delineate each site. In addition, a set of log stairs will provide access to the reservoir's shoreline trail. Trash receptacles will be provided in this location.

The narrowing of the road will allow for perpendicular parking in areas where the bedrock does not encroach into the shoulder of the road. Two accessible spaces and as many as six standard spaces will be provided in this location. Each space will be designated with log parking bumper. All of these spaces will be located within 500 feet of the reservoir. Two of the standard spaces will be designated for boaters use only. New restroom facilities will be located adjacent to this parking lot. The existing conifers along the north side of the road will screen these facilities from the reservoir.

The second parking area will be located halfway up the Haul Road at a clearing near a bend in the road (*see photo 1, page 61*). This curvilinear parking lot will accommodate eight to ten vehicles. Each space will be designated with a log parking-bumper. Again, two of the spaces here will be designated for boating use only. These parking spaces are located approximately 800 feet from the reservoir. Adjacent to this parking area will be a single unisex toilet facility. Boulders will be used to separate and protect the toilet from the adjacent parking.

The parking area farthest from the reservoir is located along the north shoulder, 500 feet from the intersection of Haul Road and the Dam Access Road. Here, six to eight parallel parking spaces will be provided. Each space will be designated with a log parking-bumper. The parking spaces in this area will serve the six picnic sites located along the drainage that runs west into the reservoir. A 24-inch natural surface trail will connect the parking area to these six sites. The sites will include picnic tables and pedestal grills on a crusher-fine base. Regulatory signage and trash receptacles will be provided at the trailhead.

The existing portable toilet facilities located at the intersection of Haul Road and the Dam Access Road will be removed. This site will be revegetated with ponderosa pine.

A natural surface fishing access trail will be provided along the reservoir shoreline. This site will connect the end of Haul Road to the picnic area and drainage to the east.

A new closure/emergency access gate will be provided at the end of the road. The existing steel bollards will be incorporated into the closure gate.

Adjacent to the closure gate, a South Boulder Creek Inlet trailhead will be developed. This trailhead will include informational/regulatory signage, trash receptacles. A 911 emergency telephone will be located near the headquarters building.

The steep and badly eroded slopes between the road and reservoir will be regraded and restored with native plant materials (See Article 405 *Rehabilitation and Restoration Plan*).

4.2.6 South Boulder Creek Inlet

All of the FERC recreation requirements have been met on this site.

A roughly two-mile hiking and fishing access trail connecting the Haul Road to the South Boulder Creek Inlet was designed and flagged in the field. The flagged trail alignment was approved jointly in the field by Denver Water and the U.S. Forest Service. The U.S. Forest Service generally agrees with the overall location of the proposed trail. However, there are a few short segments that will be adjusted in the field. This 24-inch alignment utilized existing and new trail segments (*see photo 2, page 61*). All of the new trail segments were designed at 15% grades or less. Some of the existing social trail segments incorporated in the final alignment exceed 15% grades. It was determined that use of these few short existing segments with minimal structural improvements would have less impact than cutting new trail. All existing trail sections not integrated into the new trail will be rehabilitated (See Article 405 *Rehabilitation and Restoration Plan*).

This trail alignment was designed to provide efficient yet sustainable access to the South Boulder Creek Inlet and other secondary fishing destinations along the reservoir. There are several locations where the trail ties into existing sustainable fishing access locations along the reservoir's shoreline. Social trails along the shoreline that are not sustainable will be closed and rehabilitated.

A trailhead is located at the end of Haul Road. This trailhead is comprised of directional and regulatory signage and a trash receptacle. Areas where resource damage has occurred near the trailhead will be rehabilitated.

4.2.7 Winiger Gulch Inlet

All of the FERC recreation requirements have been met on this site.

With the exception of resource protection signage located in the wetlands along the inlet, no other improvements are needed in this area by Denver Water.

4.2.8 Winiger Ridge Access and Recreation Area (*see Maps 18 & 19*)

All of the FERC recreation requirements have been met on this site.

The existing parking lot located at the intersection of FDR 359 and County Road 68J will be reconfigured to accommodate ten vehicles and two horse trailers. The substantially smaller and more efficient parking layout will include a one-way loop and designated parking spaces. The new configuration will require an additional road cut 100 feet to the west of the existing entry

road. Horse trailer parking will be provided on the outside of the loop. Each 60-foot space will accommodate a four-horse trailer and large vehicle.

The drainage and erosion problems will be addressed by the creation of a swale on the south side of the parking area. Several feet of fill material will be used to raise the elevation of the parking lot. Below this, an armored (rock) swale will convey water around the parking lot. These improvements will alleviate the ongoing drainage problems at this site. The fill material used to grade the parking area will be comprised of mineral soil and will be weed free.

The south side of the old parking lot will be reclaimed and planted with ponderosa pine. The entire parking lot will be enclosed by extending the existing jack-leg fence around the perimeter (*see photo 1, page 63*). On the southeast corner of the parking lot a new trailhead and closure gate will be developed. This gate will provide non-motorized access during the winter elk closure. In addition, a trailhead with directional/regulatory signage and trash receptacles will be provided.

FDR 359 would be closed to all motorized use about one-half mile west of the reservoir shoreline. All of the existing roads beyond this point will be closed and restored to 24-inch wide natural surface trails that provide access to shoreline campsites. This closure will entail digging up the old roadbed, scarifying the compacted soil and planting native seed mixes (*See Article 405 Rehabilitation and Restoration Plan*).

The existing roads that are converted to trail will be open to non-motorized use throughout the year.

Two small parking lots that accommodate ten vehicles will be provided at this closure. These lots have been located in areas where parking will have the least visual impact. Effective closures, signing and vegetative restoration of temporary roads will be provided to avoid encouragement of off-road recreation use. Fences and boulders will be incorporated at all road closures. Gates will be provided, as needed for emergency vehicle access.

Six sites along the reservoir will be managed as walk-in campsites. These sites will be comprised of a flattened area for tents, a campsite identification sign and a metal fire-ring. These sites will also be accessible to boaters.

Six additional campsites will be established within the FERC boundary. All of these sites will be accessible by automobile. Two parking spaces per campsite will be provided. All of the parking will be confined to perpendicular spaces adjacent to the road. Each parking area will be clearly delineated with parking bumpers and boulders.

4.2.9 Jumbo Mountain (*see Map20*)

All of the FERC recreation requirements have been met on this site.

All facilities at this location will comply with ADA accessibility.

The loop access road and parking will remain in its current configuration. Boulders will be installed in areas where additional traffic control devices are necessary. All of the picnic tables, pedestal grills and fire-rings will be replaced. A new restroom facility will be constructed adjacent to the parking area. Plantings will be incorporated to screen the restrooms from the road and adjacent picnic sites.

Designated creek access points will be provided and severely eroded banks will be stabilized with boulders.

Informational signage will be provided at key locations.

4.2.10 Rocky Point Area

After careful consideration, the U.S. Forest Service has decided to close public access to Rocky Point (Jumping Rock). As a result of neighborhood conflicts and inappropriate behavior, all of the existing access points along County Road 68J will be closed.

This closure will be implemented as soon as the signage and law enforcement presence is in place. Strict fines will be imposed for all violators.

Closure of Rocky Point will entail the fencing-off of all existing parking areas and spur roads into this area. These fences will preclude roadside parking yet, will not impede the movement of wildlife.

All of the parking sites and any exiting social trail linkages to Jumping Rock will be closed and revegetated (See Article 405 *Rehabilitation and Restoration Plan*).